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NAVY UNDERWATER SOUND LAB NEW LONDON CT  
IMPLANTING OF THE FIXED ACOUSTIC BUOY (FAB) OFF BERMUDA.(U)  
FEB 61 P T MISISCO

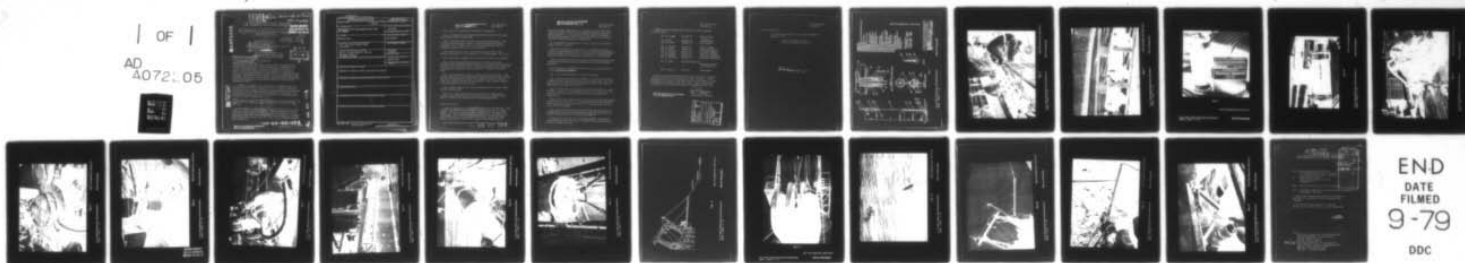
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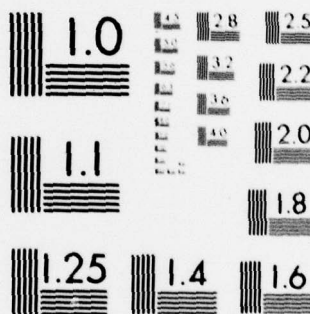
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Fig. 2 shows the mast and the hydrophone arrangement.

Fig. 3 is a detail shot showing the hydrophone placement in the mast and a portion of the wiring harness.

Figs. 4 and 4a present two views of an individual hydrophone. The film box is 4 inches square, and it is included to give some idea of hydrophone size. In Fig. 4a can be seen the preamplifier which was mounted concentric with the axis of the element.

Fig. 5 shows a general view of the pressure-proof sphere which housed the electronics. In the background the cement anchor can be seen.

Fig. 6 shows the arrangement of the electronics nested in the sphere.

Fig. 7 shows the general arrangement of the battery box which housed two sets of Nickel-Cadmium batteries. The main feeder cable to the mast can be seen on the right. The articulated chain in the foreground was connected to the sphere to prevent excessive strain on the feeder cable.

Fig. 8 shows the anchor, sphere, battery box and feeder cable. Note that the cable has been protected against chaffing by several layers of high-pressure steam hose and a manila rope whipping. Note also, the link chain used to join the battery box to the sphere. This was later replaced by the articulated chain shown in Fig. 7.

Fig. 9 shows a general view of the buoyancy tank in its cradle, alongside the launching ship.

Fig. 10 is a close-up view of the tank, and Fig. 11 shows the two pressure-relief valves mounted on the tank to permit continuous equalization of pressure with depth during the implanting operation.

#### Launch Procedures:

Implanting operations were originally scheduled for mid November, 1960, using the USS AEOLUS and a chartered commercial vessel, the Inagua Ranger. The unit was placed on board at Norfolk Va., and transported to Bermuda. While making detailed photographs of the hydrophone mast, several fractures in the poly-ethylene "tee-joints" used in the wiring harness were noticed. These were reported and promptly repaired.

The AEOLUS then proceeded to the operational area, and laid the first

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leg of the coaxial cable which was to be used to link the FAB to the monitoring station. While enroute, additional fractures in the polyethylene harness were discovered and the operations were halted. The AEOLUS returned to Norfolk, and the harness was removed and returned to Martin Company for refabrication.

It was ultimately learned that the fractures were due to improper curing of the poly-ethylene.

Because of operational commitments, the AEOLUS was unable to continue its participation and the FAB unit and its associated equipment was transferred to USS NEPTUNE. On November 28, the NEPTUNE departed Norfolk for Bermuda with the repaired FAB unit on board.

While at Bermuda, the unit was checked out electronically and a test launching was made at dockside to familiarize the crew with launch procedures.

On 9 December, the NEPTUNE arrived on station at the FAB site and began **launching operations.**

Fig. 12 is a sketch showing the method of launching.

Fig. 13 shows the unit prior to launching. Two-and-one-half miles of nylon line were attached to the buoy by a corrosive link. The other end of the line was given to the Inagua Ranger which opened range to approximately two and one-half miles.

Fig. 14 shows the buoy being towed from the NEPTUNE by a small PR Boat. Two lines may be seen attached to the nose of the buoy. One leads to the PR Boat, while the other is the nylon line attached to Inagua Ranger.

Once the buoy was afloat the mast was lowered from the NEPTUNE by three lines as shown in Fig. 15. An additional line was attached to the cement anchor and may be seen in Fig. 16. In this manner, the unit was lowered to the bottom.

Two abortive attempts to place the unit were made on December 9. In both instances the corrosive link shown in Fig. 17 broke during the original streaming operation, and had to be replaced.

On December 10 the unit was successfully planted. The coaxial cable link between the FAB and the monitoring station was completed, and the unit began operating.



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Civilian personnel aboard ship to take part in these operations are listed below:

Mr. H. Wyeth	Simplex Co.	Senior Project Leader
Mr. J. Roe	Simplex Co.	Liaison Officer
Mr. Earl Goss	Simplex Co.	Cable Splicer
Mr. L. Blickley	Martin Co.	Project Leader
Mr. D. Webb	Martin Co.	Electronic Engineer
Mr. R. Oberlin	Martin Co.	Electronic Engineer
Mr. G. Gerlach	Martin Co.	Electronic Engineer
Mr. J. Hawkins	Martin Co.	Electronic Technician
Mr. G. Overman	Martin Co.	Electronic Technician
Mr. F. Gibbs	Hastings Raydist Co.	Navigation Equipment Engineer
Mr. P. Misisco	USN USL	Photographer

While aboard the USS AEOLUS and the USS NEPTUNE I arranged to ride the helicopters assigned to assist on these operations. Aerial photographs were taken, of the Naval facilities in Bermuda, the ships assigned to this operation, and Argus Island. Negatives and prints are on file at the USN USL Photo-Optical Techniques Branch office.

*Paul T. Misisco*  
PAUL T. MISISCO  
Photographer (Scientific)

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List of References:

(a) Fixed Acoustic Buoy, by L. Buckley, Martin Co.  
Baltimore, Md.

Engineering Report 11213,  
USL Acc. #34807, of May 1960

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NOMENCLATURE:-

- 1 LOWERING CABLE
  - 2 DISCONNECT FOR LOWERING CABLE (Coaxial Link)
  - 3 BUOYANCY TANK
  - 4 MILLER BALL BEARING SHIVEL
  - 5 WIRE ROPE CLIP
  - 6 GALVANIZED WIRE ROPE (1/2" DIAM)
  - 7 HYDROPHONE
  - 8 HYDROPHONE SUPPORT STRUCTURE
  - 9 TILT INDICATOR & CONTAINER
  - 10 BATTERIES & CANNISTER (EXISTING)
  - 11 CHAIN & ANCHOR SHACKLES
  - 12 COAX CABLE RUBBING WEAR SHIELD
  - 13 SOLID STEEL CABLE THIMBLE
  - 14 LINK PLATES
  - 15 ARMORED SUBMARINE CABLE
  - 16 PRESSURE VESSEL (EXISTING)
  - 17 CABLE TERMINAL SUPPORT BRACKET
  - 18 HOISTING FITTING
  - 19 SHIELD & SUPPORT FOR ELECT. WIRING
  - 20 STEEL TUBE FOR ELECTRICAL CONDUIT
  - 21 FLEXIBLE CONDUIT TUBE
  - 22 NUT - CABLE ARMOR SUPPORT
  - 23 TAPERED-HOLE CABLE FITTING
  - 24 LOCK SCREW
  - 25 CABLE ARMOR HOOK SHAPE
  - 26 ANTI-ROTATION KEY WAY
  - 27 THREADED STRUCTURAL NIPPLE
  - 28 CONICAL BUSHING
  - 29 LOCK RING AN 996
  - 30 COAX CABLE
- FIXED ACOUSTIC BUOY  
WET NET WEIGHT ..... 690 LB  
TOTAL DRY WEIGHT ..... 4390 LB  
BUOYANCY OF BUOY .... 450 LB  
CAPACITY OF BUOY 385 GAL.

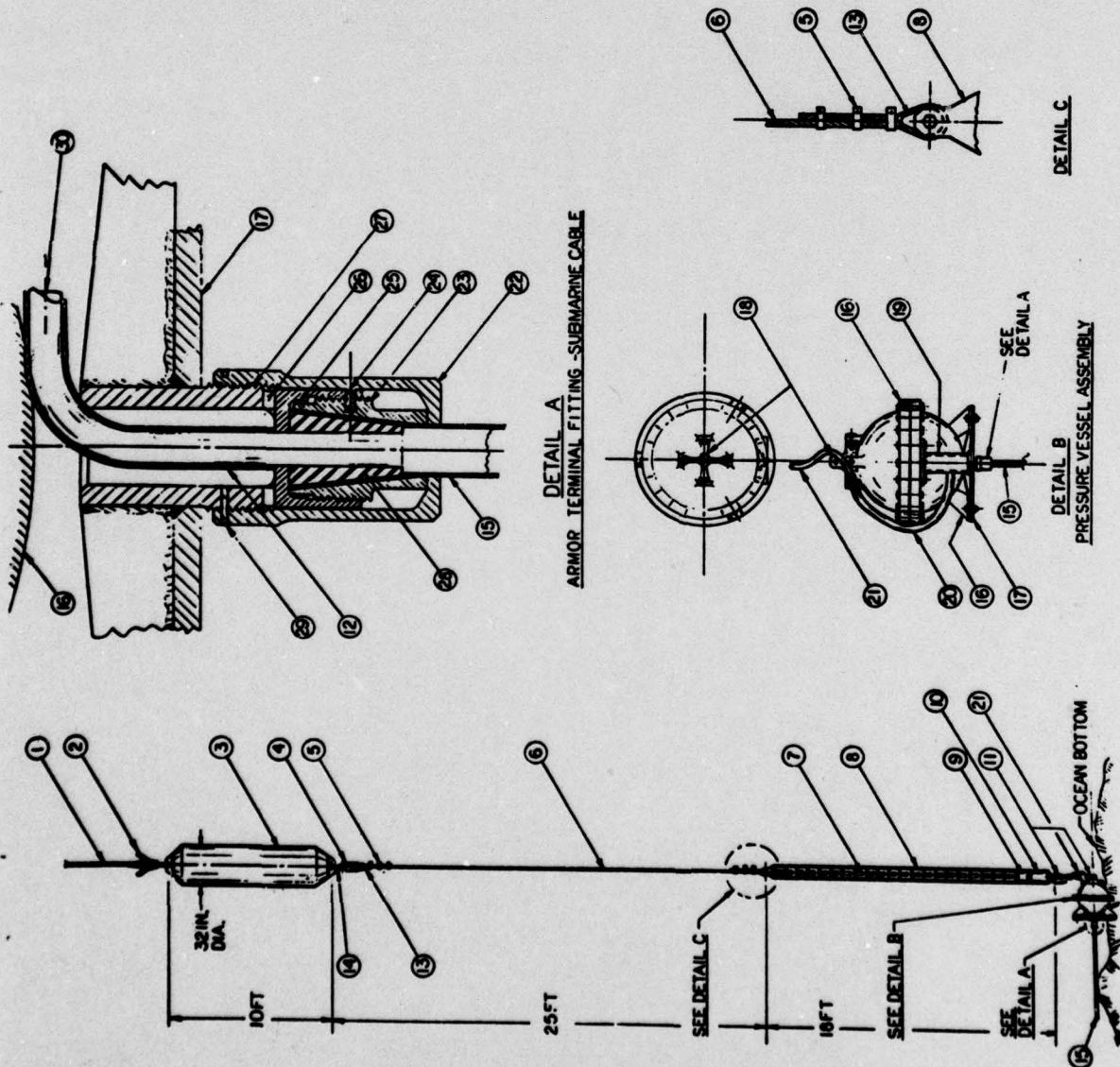


Fig. 1

THE MARTIN COMPANY	
BALTIMORE, MARYLAND	
PROJECT	DEEP WATER STATION
DESIGN	FIXED ACOUSTIC BUOY
DATE	PROGRAM FIGURE 1
NO.	400-000036

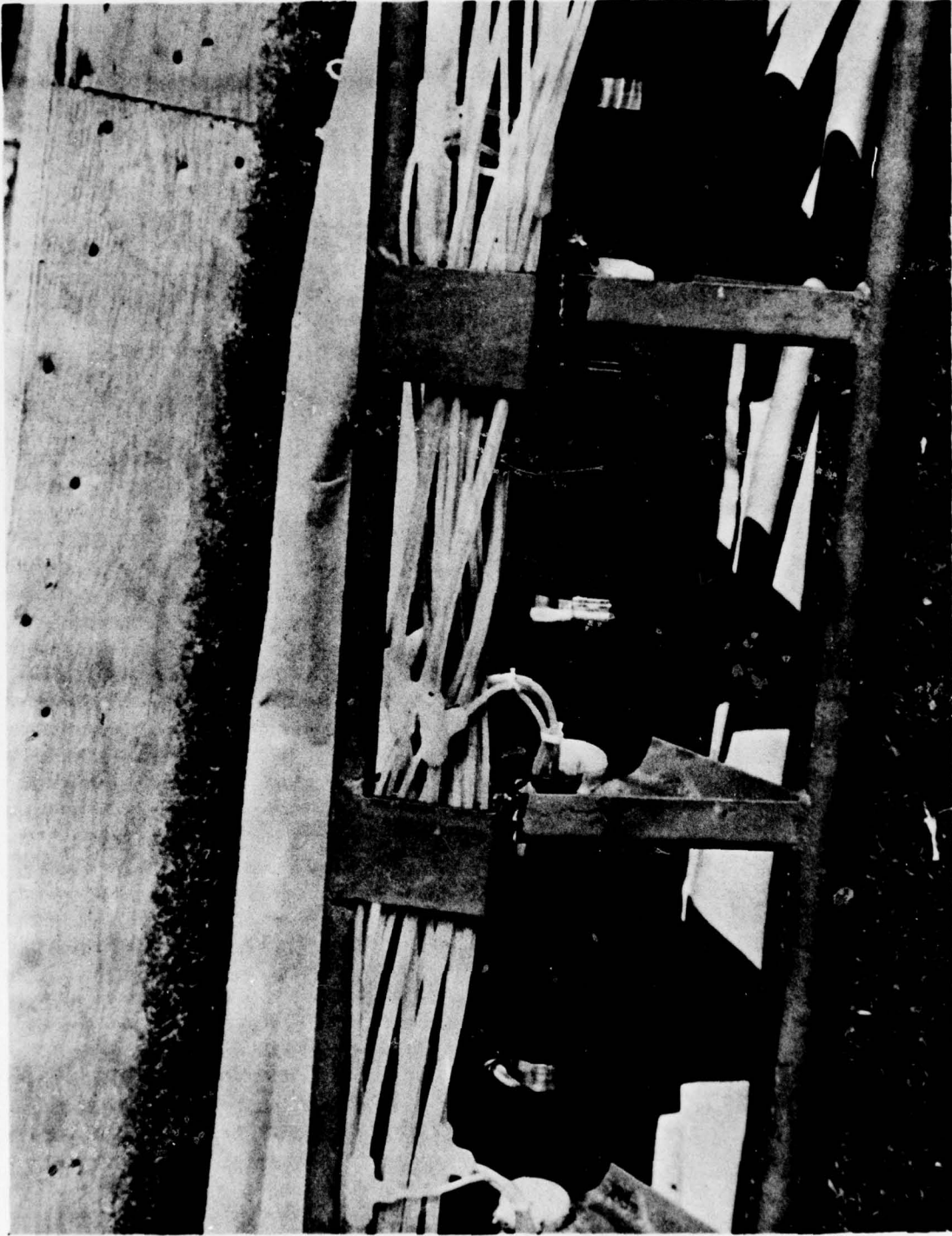


**Fig. 2**

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NP24 - 19857 - 3 - 61**

**USL Tech Memo No. 953-12-61**

**Official Photograph**



**Fig. 3**

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**U. S. Navy Underwater Sound Laboratory  
NP 24 - 19858 - 3 - 61**

**Official Photograph**





Fig. 4

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Official Photograph



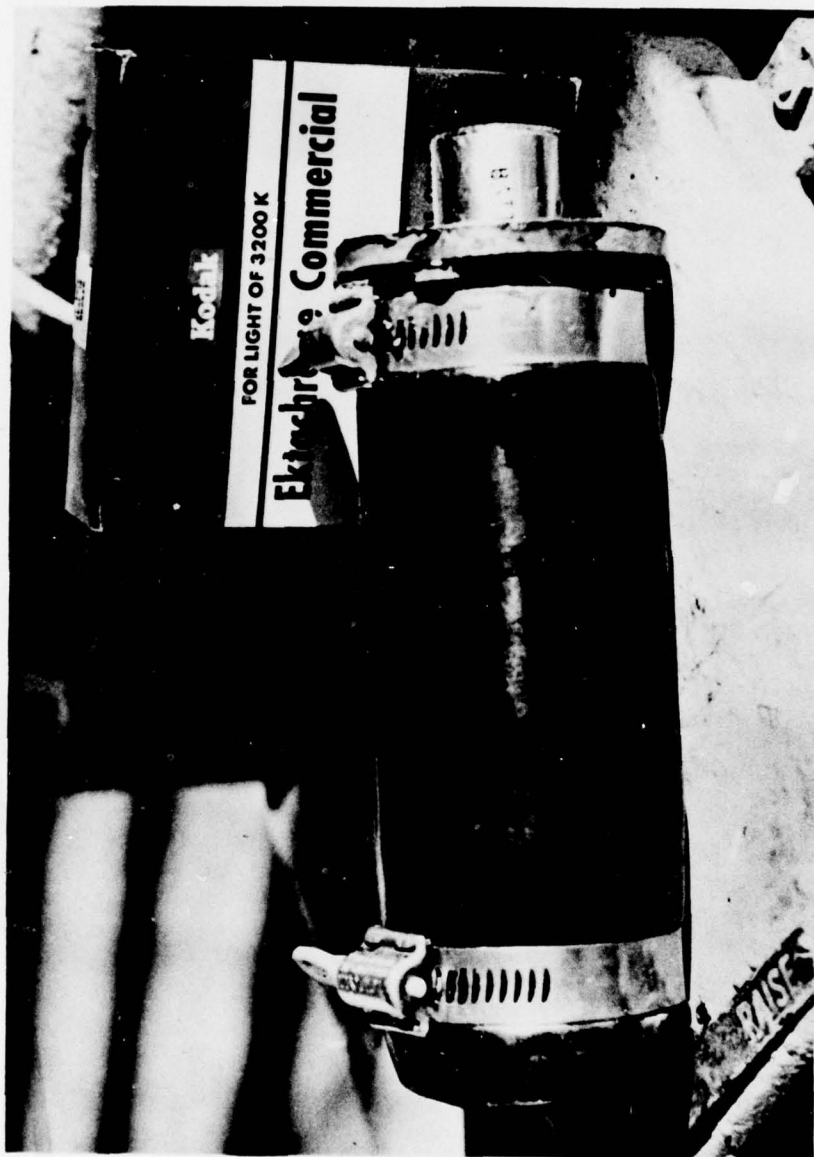


Fig. 4A

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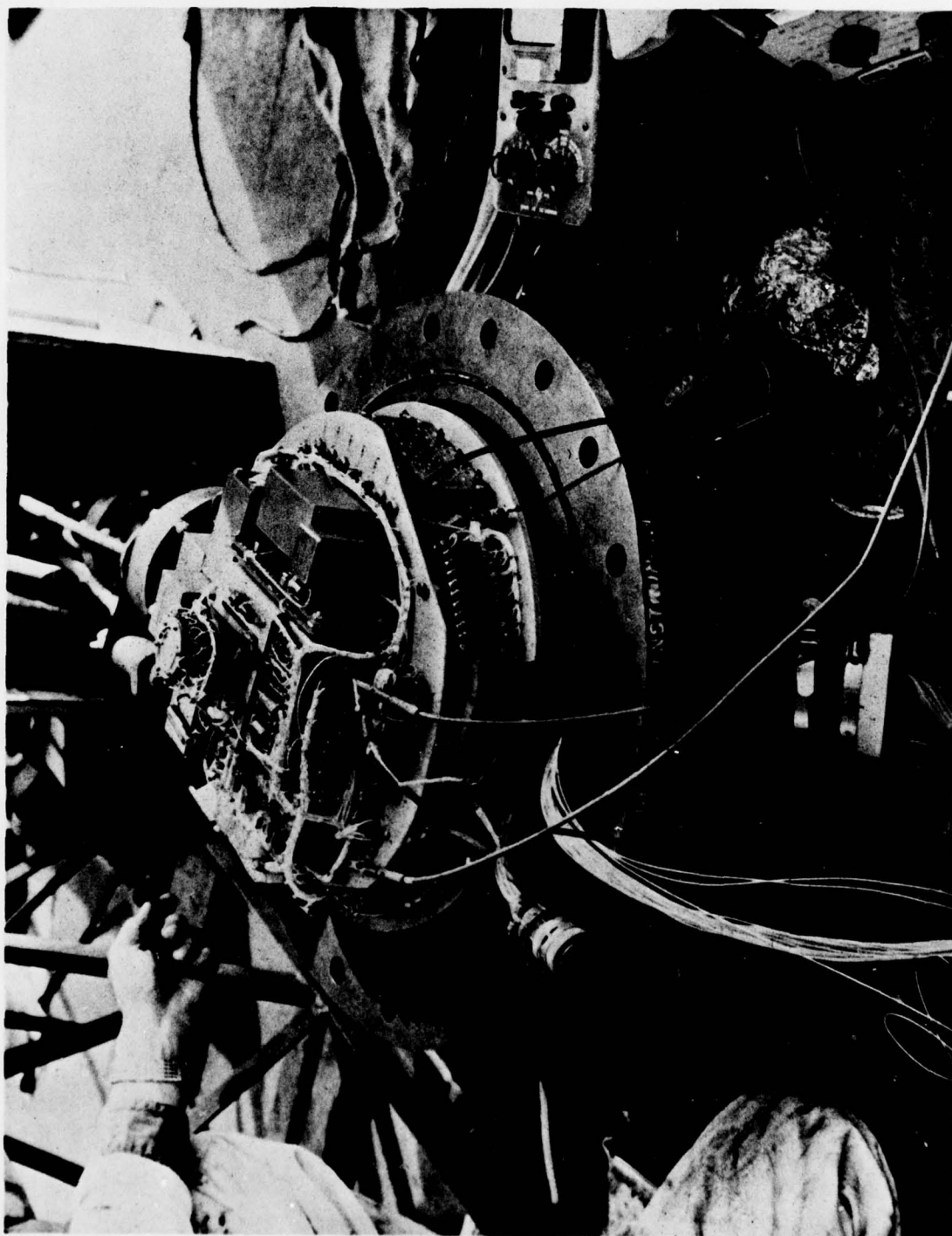


Fig. 5

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Official Photograph

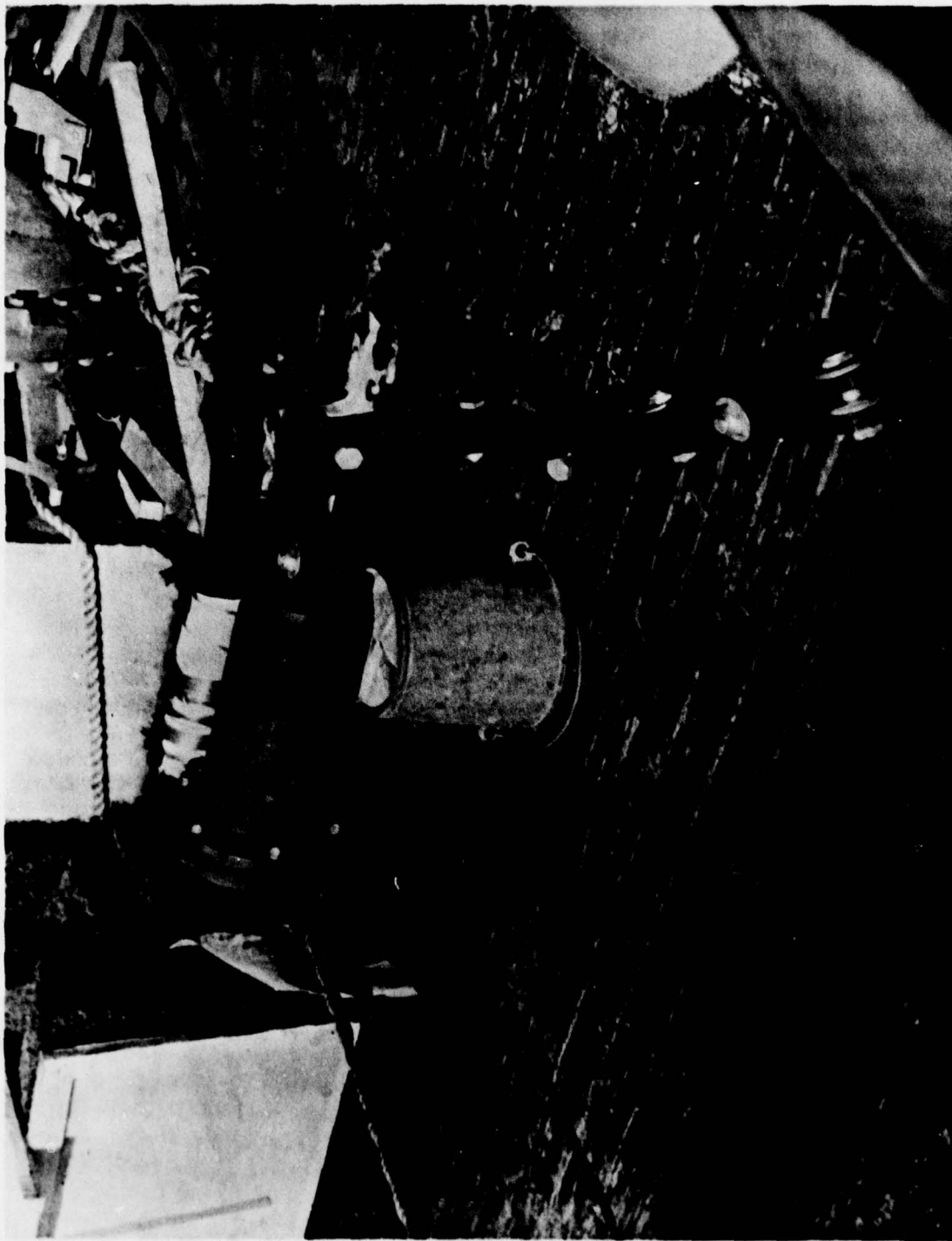


**Fig. 6**

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Fig. 7

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HUDSON LABORATORIES  
CONTRACT Nonr-266004



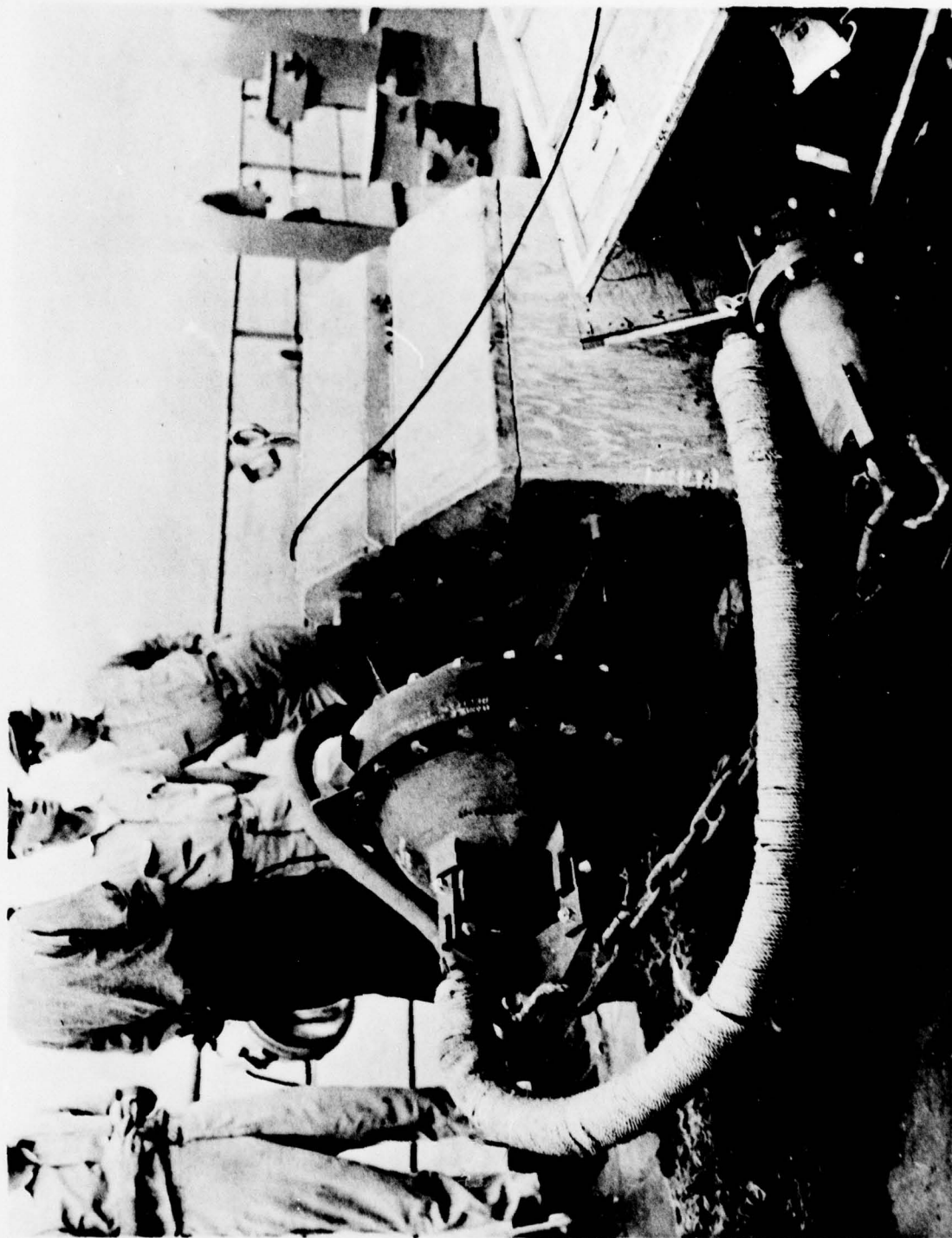
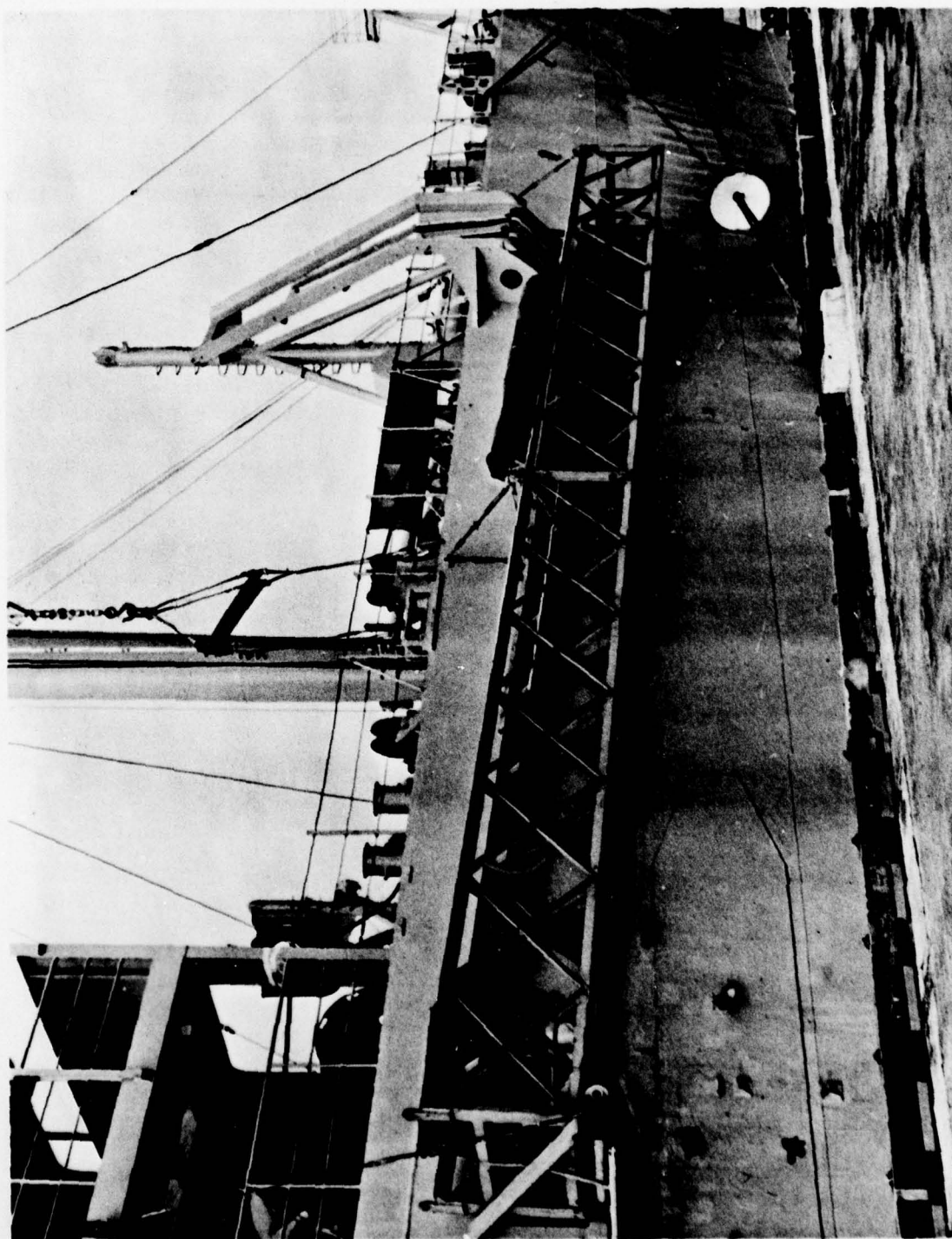


Fig. 8

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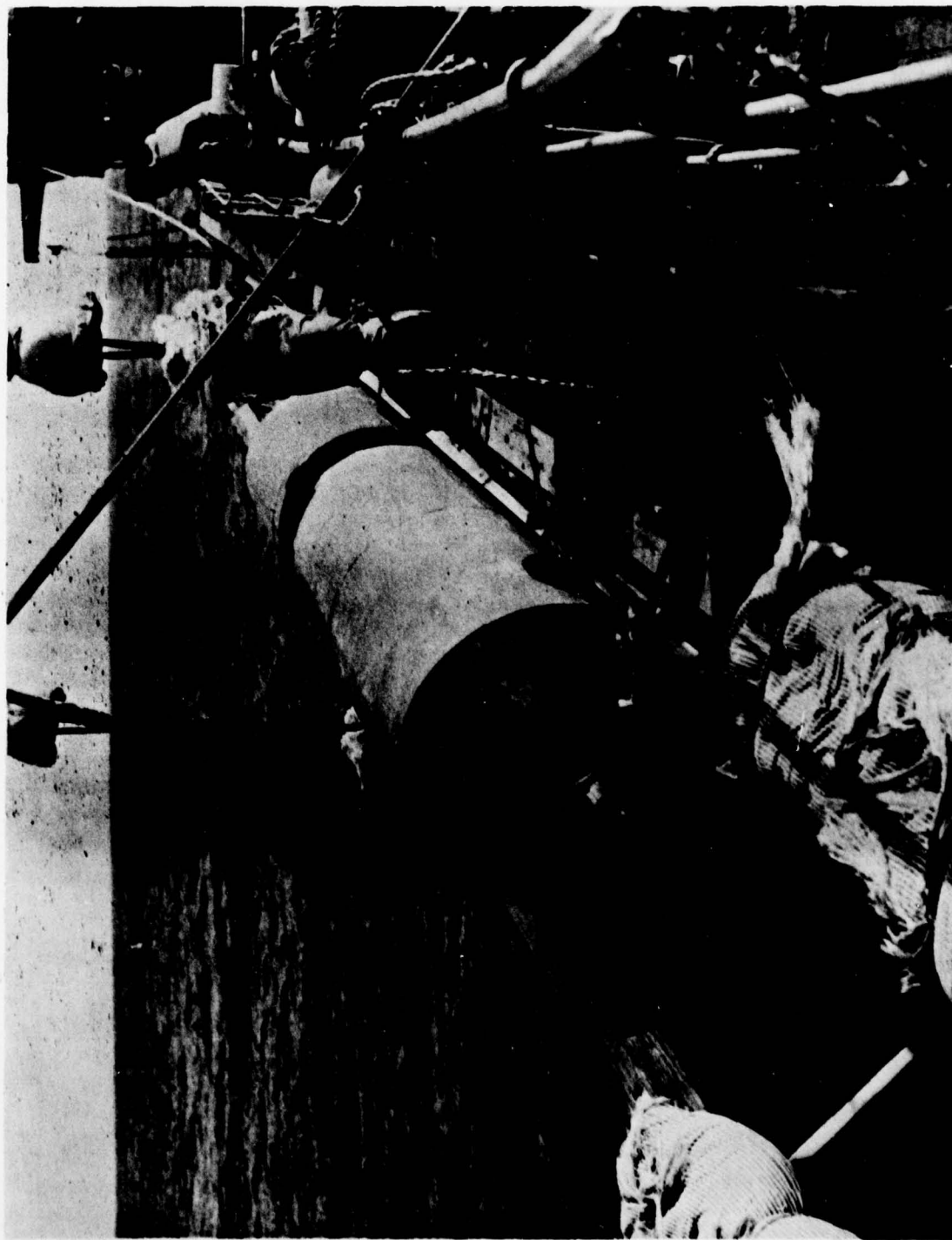


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Fig. 9

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**Fig. 10**

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**Official Photograph**



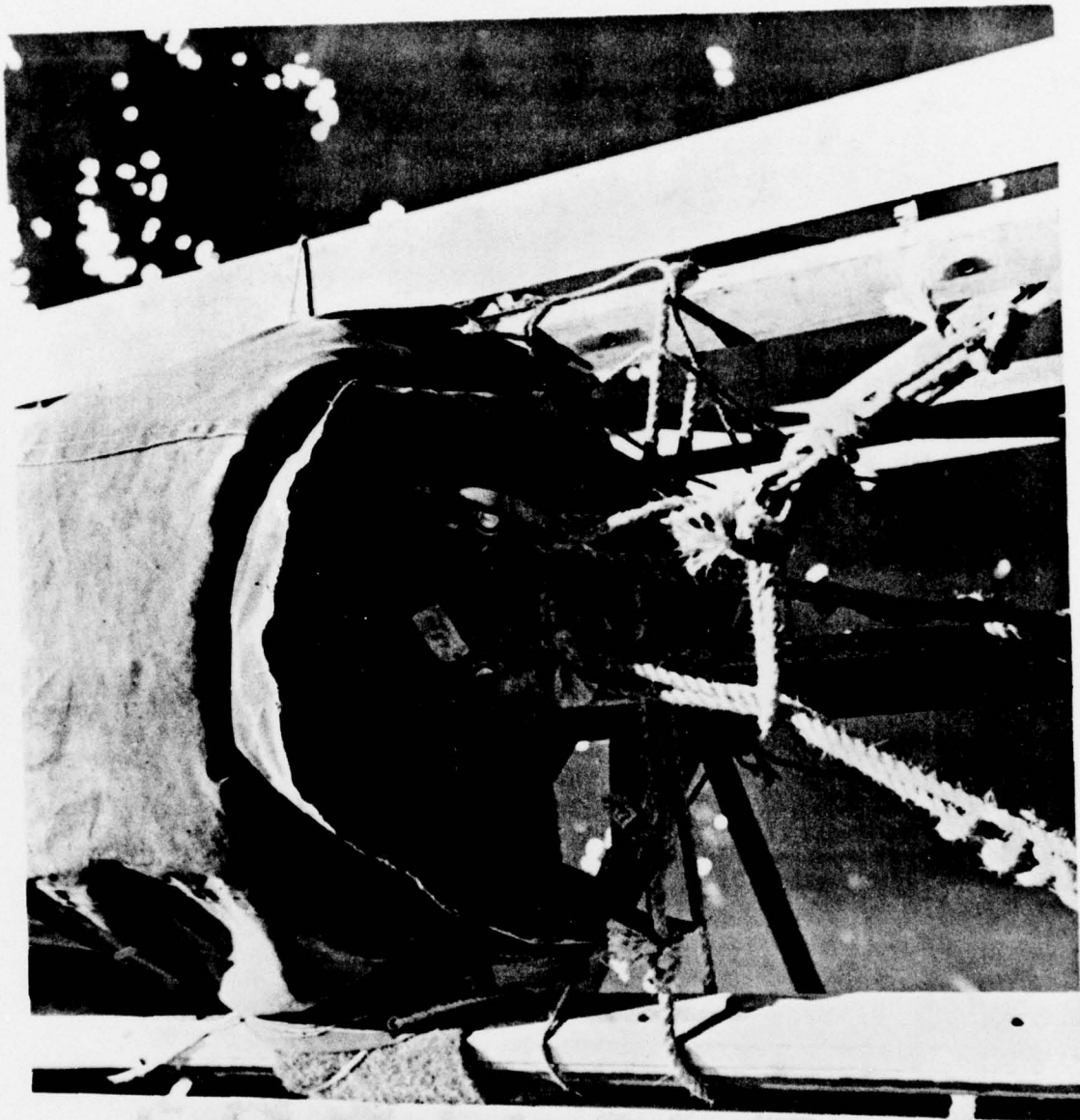


Fig. 11

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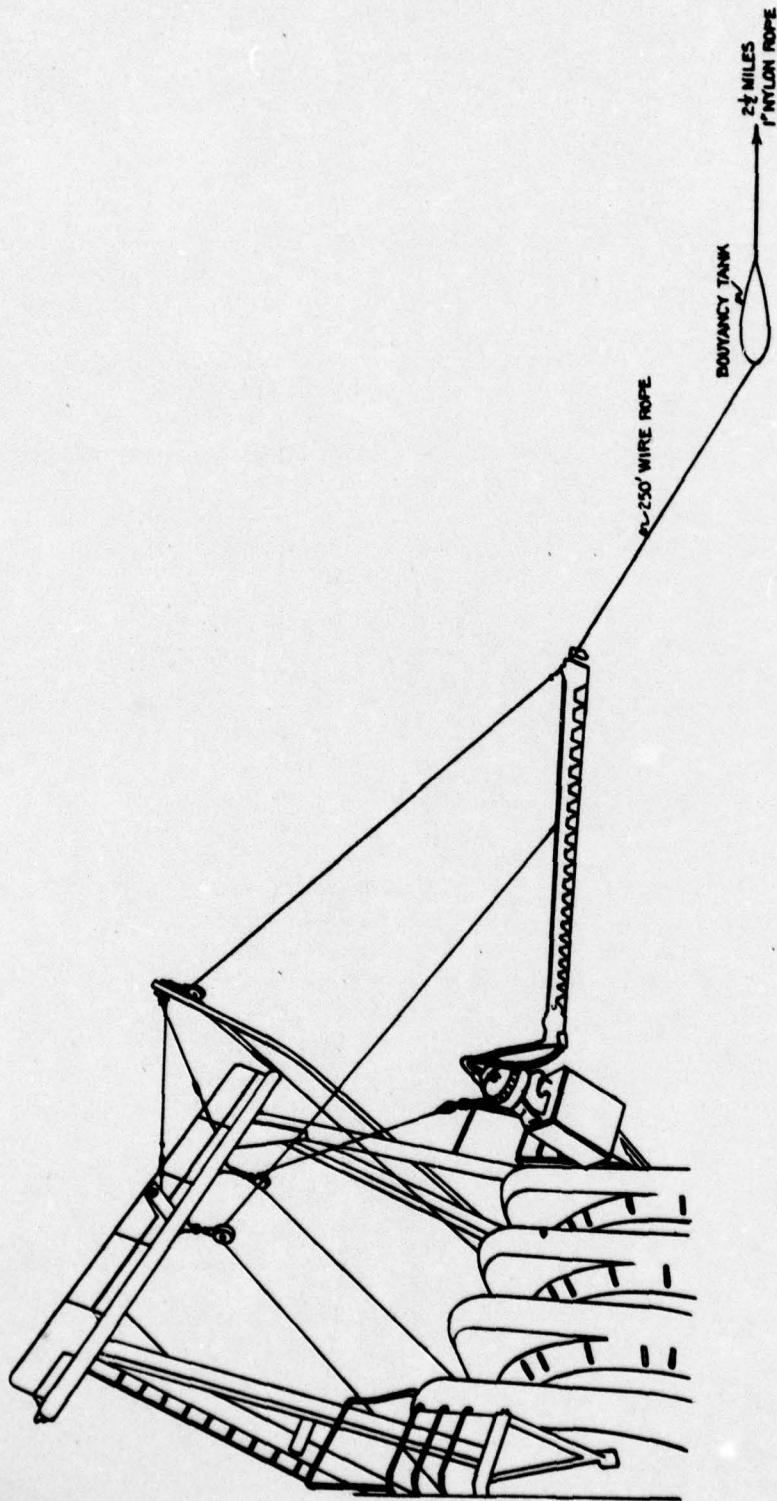
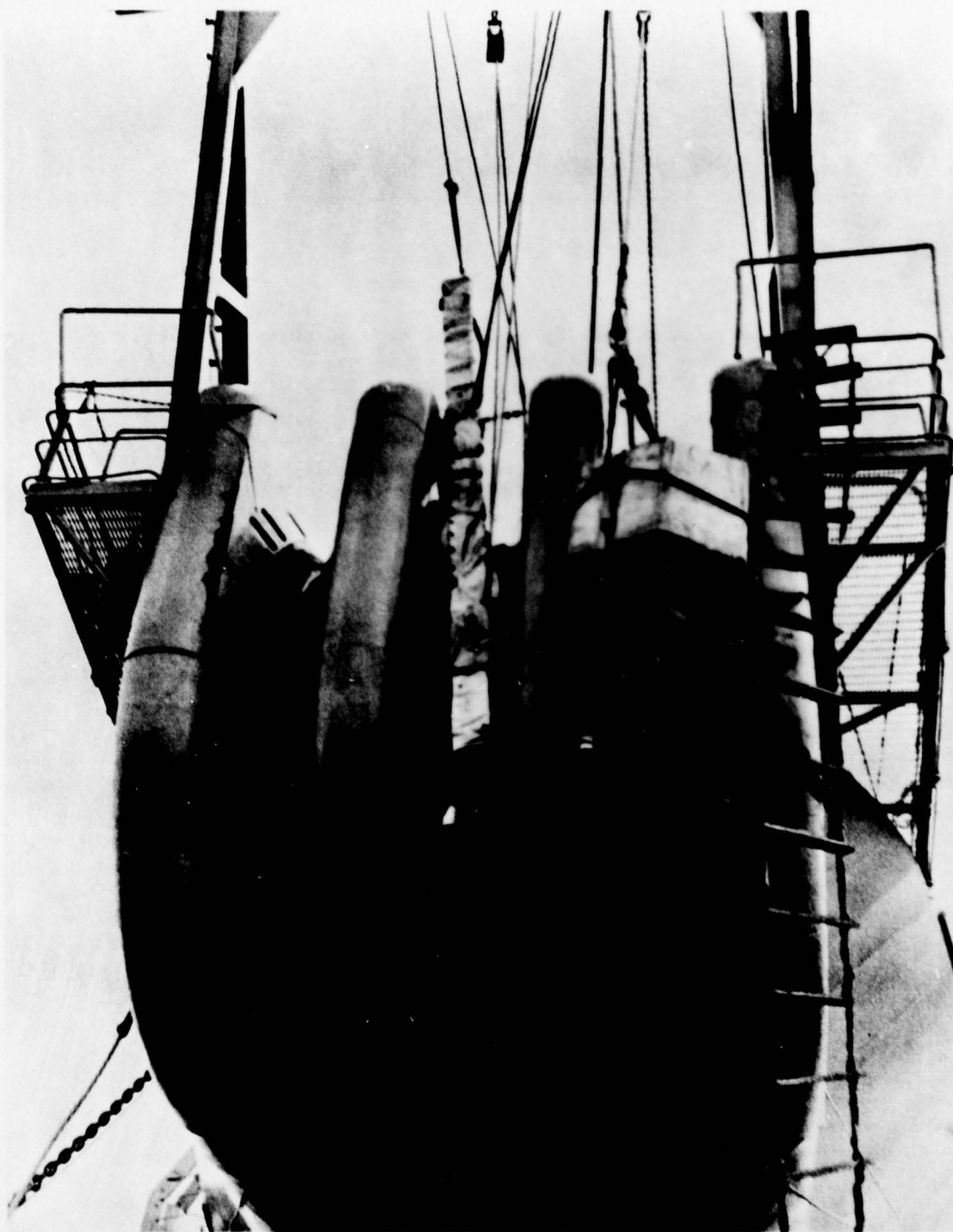


Fig. 12

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**Fig. 13**

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**Official Photograph**



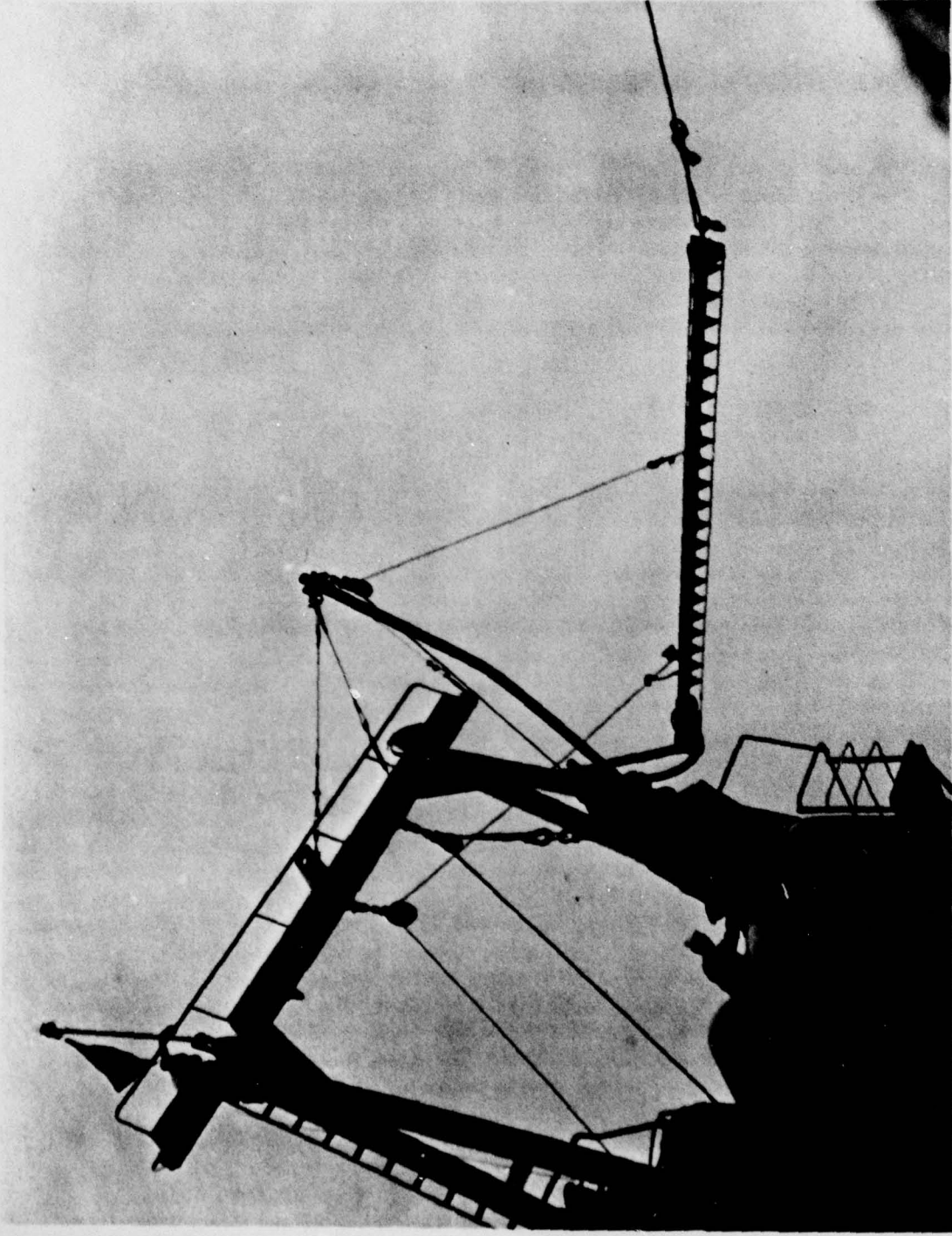
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**Fig. 15**

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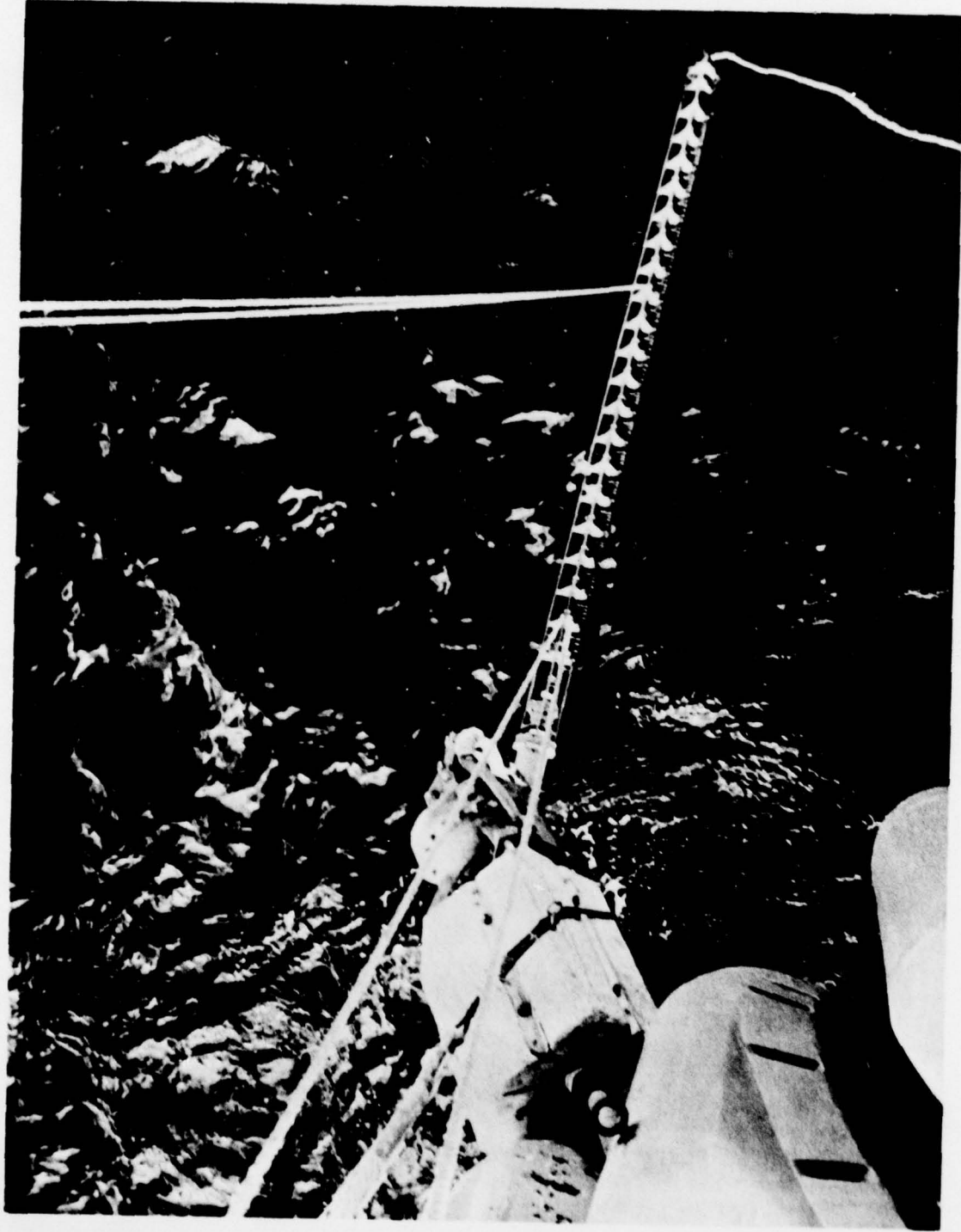
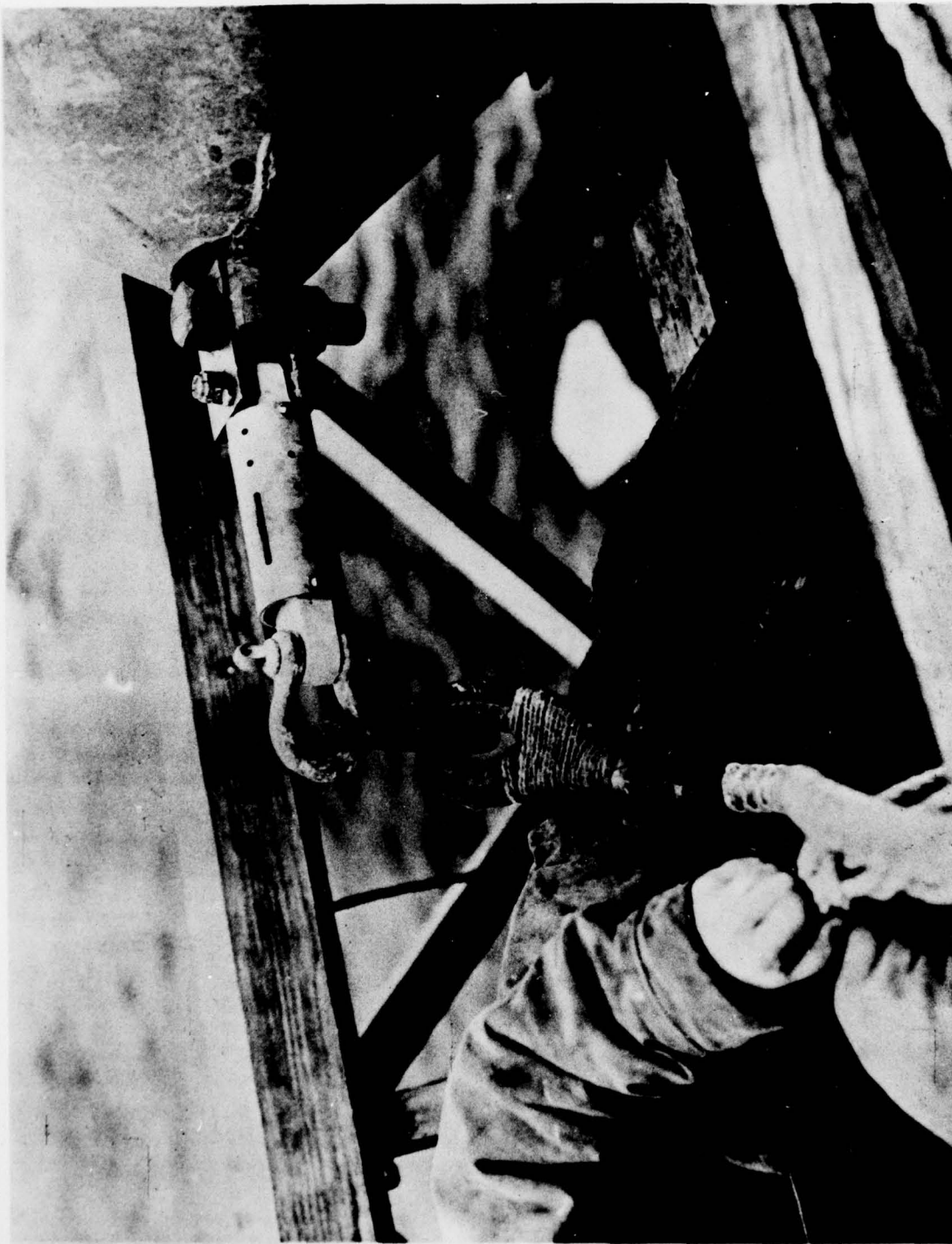


Fig. 16

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**Fig. 17**

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FORT TRUMBULL, NEW LONDON CONNECTICUT

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From: Commanding Officer and Director  
U. S. Navy Underwater Sound Laboratory  
Fort Trumbull, New London Connecticut  
To: Department of the Navy  
Chief, Bureau of Ships (Code 370)  
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